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WHITENING COSMETIC MATERIAL CONTAINING NATURAL SANG-HWANG

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WHITENING COSMETIC MATERIAL CONTAINING NATURAL SANG-HWANG

[Ja-yun-san sang-hwang-bu-sut choo-chool-mool-yee ham-yoo-doin mi-bak-hwa-jang-ryo]

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Detailed statement /2*

Brief description of the figures

Figure 1 is an extract process diagram of the natural Phellius Linteus extract used in the present invention.

Figure 2 is an ultraviolet (UV) spectrum of the natural Phellius Linteus extract used in the present invention.

Figure 3 is a graph that shows melanin synthesis inhibition experiment results from the natural Phellius Linteus extract used in the present invention.

Figure 4 is a graph that shows the skin color improvement effect of the whitening cosmetic material containing natural Phellius Linteus extract of the present invention.

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* [The numbers in the right margin indicate pagination of the original foreign text.]

Detailed explanation of the invention

Objective of the invention

Prior art

The present invention concerns a whitening cosmetic material containing natural Phellius Linteus extract. In more detail, the present invention relates to a whitening cosmetic material containing natural Phellius Linteus extract, which and is prepared by combining one or more types of ultra-violet absorbent or ultra-violet dispersion agents, one or more types of peptide that inhibit melanin synthesis, licorice root extract, arbutin, rice extract, and vitamin C with natural Phellius Linteus extract that was efficiently extracted by grinding natural Phellius Linteus with certain degree of hardness into a fine powder, treating this natural Phellius Linteus powder with a ultrahigh frequency waves in a specific solvent under reduced pressure, pasteurizing, decoloring, and deodorizing. This natural Phellius Linteus extract was intended to have the following functions: prevention of skin browning by ultraviolet rays or pigment deposits; inhibition of melanin synthesis in skin to improve skin color tone, liver spots, and freckles; and skin aging prevention by an anti-oxidation effect.

In general, Sang-Hwang mushroom (Phellius Linteus) is called "Sang Yee [transliteration]" since ancient times in China, and lives on mulberry trees. As found in Korea, it was known that Sang-Hwang mushroom grows in the heartwood of some broadleaf trees (Dong Ryul Cha, Monthly Sericulture, P34-37, December, 1992), and belongs to Phellius Quel. Em. Imaz of the Hymenochaetaceae [family]. Sang-Hwang mushroom means Phellius Linteus in Korea.

Approximately 48 types of Phellius Linteus are reported worldwide. There are 8 types of Phellius Linteus in Korea, which include P. ferrginosus, P. gilvus, P. igniarius, P. laevigatus, P. pomaceus, P. robustus, P. coniferous, and P. pini. Pharmacological effects of Phellius Linteus are known to include an anti-cancer effect, immunity reinforcement function, tumor (growth) impediment effect, and effective treatment of female disease including metrorrhagia and menstrual irregularity.

In addition, it was reported [T. Iked, T.T. Sutsumi, Fragrance J., 6, 59 (1990)] that natural Phellius Linteus extracts contain various types of sugars, flavonoid components, fiber, and isoflavones in large quantity, and thereby has excellent moisture retention, skin aging prevention, anti-oxidation effect, and especially very excellent skin whitening effect. Physiological aging and photo-aging are known to play important roles in skin aging. Among them, the most convincing explanation is that one of the reactive oxygen species, free radicals, generated in the cells, alters biological molecules such as lipids, proteins, and nucleic acids to cause aging (Harman, 1956; Richter et. al., 1988; Oliver et. al., 1987; Brank et. al. 1992). /3

Such active oxygen species are formed during normal metabolism, and can be formed in excess when one is sick or under stress. Especially, when skin is exposed to ultraviolet ray, photochemical reactions continue to take place and form active oxygen species. In addition, smoking, air pollution, and bacterial infection can generate active oxygen species. Excessive active oxygen species jeopardizes the anti-oxidation prevention network of the skin and subsequently oxidizes lipids and DNA to cause pathological cancers and skin aging such as reduced skin elasticity, wrinkles, freckles, and liver spots. Skin aging can be delayed when the skin anti-oxidation preventing network is strengthened by continuous supplement of anti-oxidants through food or cosmetics containing the necessary anti-oxidants.

Therefore, a cosmetic material that can prevent freckles and liver spot development and remove pigment deposits must be prepared by combining melanin synthesis and formation inhibiting agents, ultraviolet blocking agents, moisturizing agents to prevent skin aging, and metabolism accelerating agents.

Recently, products containing Phellinus Linteus extract have been sold in the medical and cosmetic fields, and have proven to be excellent in whitening effect and anti-oxidation effect. However, most of these products use artificially grown Phellinus Linteus which contains a very small amount of the components beneficial to human body. The extracts of artificially grown Phellinus Linteus are prepared using water and therefore the extraction yield is low, which is therefore inefficient in preventing melanin pigment deposits and for preventing and treating freckles and liver spots.

As suggested for the extraction method of the existing artificially grown Phellinus Linteus extracts and cosmetics using the extracts in Korean Patent No. 98-50697 (Publication data: September 15, 1998), the artificially grown Phellinus Linteus with low strength was pulverized to a mash. The mashed mushroom extracts are usually obtained by a water extraction method wherein the mashed mushroom is stirred in water; by an ethanol extraction method wherein the mashed mushroom is stirred in 60-95% of ethanol; by a mixed solution extract method wherein the mashed mushroom is stirred in a mixture of 1,3-butylene glycol and water; or by other conventional methods.

However, such artificially grown Phellinus Linteus contain a very low content of the aforementioned various sugars, flavonoids, fiber, and isoflavone in comparison to naturally grown Phellinus Linteus. For this reason, when the artificially grown Phellinus Linteus is used for the cosmetic material, actual intrinsic effect cannot be obtained. In addition, naturally grown Phellinus Linteus has a strength of approximately 0.5-0.8 N/mm^2 compared to artificially grown Phellinus Linteus, and therefore it is difficult to retrieve extracts from naturally grown Phellinus Linteus using the aforementioned stirring method.

In another conventional method, extracts obtained from the growth of Phellinus Linteus or its culture medium are used as described in Korean Patent No. 98-38284 (Publication data: August 5, 1998).

In Korean Patent No. 98-38284, the extract obtained from Phellinus Linteus or its culture medium were prepared by adding distilled water to the culture; extracting with hot water for 3 h at approximately 100°C; filtering the hot water extracts or the culture medium after removing material using ultrafilter membrane of molecular weight 10,000 to remove low molecular weight material with molecular weight less than 10,000. Precipitates obtained by adding alcohol were recovered by centrifuge and these precipitates are used as a cosmetic component.

However, in the existing method described in Korean Patent No. 98-38284, the Phellinus Linteus was cultured, and thereby it has the disadvantage of a significantly low effectiveness in pharmacological action such as anti-cancer effect, immune strengthening function, tumor inhibiting effect, metrorrhagia, and menstrual irregularity.

Technical task of invention /4

The present invention aims to solve the aforementioned problems. The technical task of the present invention is to prepare a whitening cosmetic material that can prevent skin browning or pigment deposits caused by ultraviolet rays, that can improve skin color tone, liver spots, and freckles by inhibiting melanin synthesis in the skin, and that has a skin aging prevention function through an anti-oxidation effect, wherein naturally grown Phellinus Linteus is used, which has much higher contents of various kinds of sugars, flavonoid components, fiber, and isoflavones than the artificially grown Phellinus Linteus and has a strength of approximately 0.5-0.8 N/mm^2. The aforementioned naturally grown Phellinus Linteus is mechanically pulverized to form a fine powder; this pulverized naturally grown Phellinus Linteus is treated with high frequency wave at 55-65°C under reduced pressure using a solvent such as ethanol aqueous solution, 1,3-butylene glycol, propylene glycol, and isopropanol, which is then filtered with active carbon to obtain naturally grown Phellinus Linteus extracts; this naturally grown Phellinus Linteus is mixed with one or more types of ultraviolet blocking agent or ultraviolet dispersion agent, one or more types of peptides that inhibit melanin synthesis, licorice root extract, arbutin, rice extract, and vitamin C to prepare a whitening cosmetic material.

The present invention concerns naturally grown Phellinus Linteus extract which is recovered by pulverizing naturally grown Phellinus Linteus with a strength of approximately 0.5-0.8 N/mm^2 to form a powder and treating this naturally grown Phellinus Linteus powder with ultra high frequency waves under reduced pressure in a specific solvent, followed by discoloring and removing odor. The present invention is composed of 20 parts by weight of the aforementioned naturally grown Phellinus Linteus extract, 3.0 parts by weight of setostearyl

alcohol, 1.0 part by weight of wax, 3.0 parts by weight of self-emulsifying monostearic acid glycerin, 1.0 part by weight of lolisorbate, 0.4 part by weight of sorbitan stearate, 1.6 parts by weight of preservative, 5.0 part by weight of anti-oxidant, 10 parts by weight of mineral oil, 5.0 parts by weight of squalene, 5.0 parts by weight of sodium hyaluronate, 5.0 parts by weight of propylene glycol, and 40 parts by weight of purified water.

Structure and action of invention

The whitening cosmetic material containing the naturally grown Phellinus Linteus extract of the present invention is described below in detail using Figure 1 to Figure 4.

Figure 1 is a extraction process diagram of naturally grown Phellinus Linteus employed in the present invention, wherein naturally grown Phellinus Linteus with strength of approximately 0.5-0.8 N/mm^2 is first washed with clean water to remove foreign materials in the washing process (1), and then the aforementioned washed naturally grown Phellinus Linteus is dried for 1-2 months at 20-25°C in a place where sunlight is blocked and ventilation is good so that the water content in the mushroom is less than 5% in the dry process (2).

Pulverizing process (3) is carried out by primarily pulverizing the naturally grown dried Phellinus Linteus to contain less than 5% moisture through the aforementioned dry process (2) to a size of approximately 5-15 mm using a pulverizing device, and then pulverizing the aforementioned primarily pulverized naturally grown Phellinus Linteus for the second time to 8-12 mesh particles using a precision pulverizing device (Henshel Mixer AM - 7, Japan) to form the naturally grown Phellinus Linteus powder.

The naturally grown Phellinus Linteus powder pulverized to 8-12 mesh particles through the aforementioned pulverizing process (3) was mixed with an extraction solvent, 30% 1,3-butyleneglycol aqueous solution, in a ratio of 1:3, which was then held at 55-65°C for approximately 48 h under reduced pressure of 0.6-0.8 kgf/cm^2 to carry out the indirect heating process under reduced pressure. During the above indirect heating process under reduced pressure (4), the ultra-high frequency wave treatment process (5) is simultaneously performed for approximately 24 h, wherein ultra-high frequency waves are applied.

Herein, the indirect heating process under reduced pressure means that the mixture solution is not directly heated but indirectly heated in a water bath so that uniform and constant heat transfer can be accomplished, after the naturally grown Phellinus Linteus powder and extraction solvent, 30% 1,3-butyleneglycol aqueous solution, are mixed. In addition, the reason for supplying ultra-high frequency waves in the indirect heating process under reduced pressure (4) is to increase the extraction efficiency by applying heat to the naturally grown Phellinus Linteus and the extraction solvent upon supplying ultra-high frequency waves, so as to improve the desired whitening effect.

After the aforementioned heating process under reduced pressure (4) and the ultra-high frequency treatment process (5) are completed, the filtering and pasteurizing process (6) is performed wherein the naturally grown Phellinus Linteus powder particles and impurities are first filtered through filter paper, and then filtered a second time through 0.45 mm bacteria removing filter paper to eliminate bacteria. Then, the odor removing and discoloring process (7) is carried out by passing through an active carbon column to remove odor and decolor the extracts, which completes the recovery of naturally grown Phellinus Linteus extract. /5

Other experimental examples for the extraction process of the naturally grown Phellinus Linteus extracts used in the present invention are described below, wherein the washing process (1), drying process (2), pulverizing process (3), ultra-high frequency wave treatment process (5), filtering and pasteurizing process (6), and odor removing and decoloring process (7) are identical as in the aforementioned process except the indirect heating process under reduced pressure (4). The difference in the indirect heating process is described below.

Experimental Example 1

As described above, the drying process (2) and the pulverizing process (3) were carried out in order to obtain naturally grown Phellinus Linteus powder in 8-12 mesh particles, which was then combined with an extracting solvent, 30% ethanol aqueous solution, in a 1:3 ratio. The resulting mixture was held for 5 days, and then indirectly heated to 55-65°C under reduced pressure of 0.6-0.8 Kgf/cm^3 to evaporate ethanol during the indirect heating process under reduced pressure (4), which was followed by the filtering and pasteurizing process (6) and the odor removing process (7) in that order.

Experimental Example 2

As described above, the drying process (2) and the pulverizing process (3) were carried out in order to obtain naturally grown Phellinus Linteus powder in 8-12 mesh particles, which was then combined with an extracting solvent, propylene glycol aqueous solution, in a 1:3 ratio. The resulting mixture was left for 48 h, and then indirectly heated to 55-65°C under reduced pressure of 0.6-0.8 Kgf/cm^3 during the indirect heating process under reduced pressure (4), which was followed by the filtering and pasteurizing process (6) and the odor removing process (7).

Experimental Example 3

As described above, the drying process (2) and the pulverizing process (3) were sequentially carried out to obtain naturally grown Phellinus Linteus powder in 8-12 mesh particles, which was then combined with an extracting solvent, distilled water, in a 1:4 ratio. The

resulting mixture was left for 48 h, and then indirectly heated to 75-85°C under reduced pressure of 0.6-0.8 Kgf/cm^3 during the indirect heating process under reduced pressure (4), which was followed by the filtering and pasteurizing process (6) and the odor removing process (7).

Experimental Example 4

As described above, the drying process (2) and the pulverizing process (3) were sequentially carried out to obtain naturally grown Phellinus Linteus powder of 8-12 mesh particles, which was then combined with an extracting solvent, a mixture of 20 part by weight of ethanol, 20 parts by weight of 1,3-butyleneglycol, 30 parts by weight of propylene glycol, 20 parts by weight of isopropanol, and 20 parts by weight of distilled water, in an 1:3 ratio. The resulting mixture was left for 48 h, and then indirectly heated to 55-65°C under reduced pressure of 0.6-0.8 Kgf/cm^3 during the indirect heating process under reduced pressure (4), which was followed by the filtering and pasteurizing process (6) and the odor removing process (7).

As shown in Figure 2, the ultraviolet absorption spectrum analysis result of the naturally grown Phellinus Linteus extracted by the method of above Experimental Examples 1-4, the extracts have strong ultraviolet absorption capability (190 nm - 400 nm). The comparison of the extract of the present invention with general ultraviolet ray blocking agent (irritation value 2) by testing for the application of the extract as a skin cosmetic material indicates that the extract exhibits very low irritation value (0.80). The anti-oxidation effect of the extract (94.7%) tested using linoleic acid was excellent compared to the artificially grown Phellinus Linteus extract (79.8%), vitamin E (43.3%), green tea extract (83.1%), and carrot extract (17.0%), which were used as control groups.

The free radical scavenging effect of the extract of the present invention (87.10%) was determined by DPPH method and was also found to be very high compared to those of gingko leaf extracts (69.5%) and vitamin E (36.5%). As whitening efficiency tests, tyrosine inhibiting effect method, melanin formation inhibiting experiment on C57BL Mouse ear, and melanin formation obstruction in microorganism (Streptomyces bikiniensis) were used. In the clinical study, the whitening effect of the extract of the present invention is higher than those of naturally grown Phellinus Linteus, vitamin C, arbutin, and kojic acid, which were used as control groups. Photo-aging inhibition by the extract of the present invention was also shown to be very excellent in blocking ultraviolet rays.

As described above, the naturally grown Phellinus Linteus extract obtained by the methods of Experimental Examples 1-4 was tested for the whitening effect, ultraviolet ray absorption capacity, inhibition of melanin formation and loss of melanin after ultraviolet irradiation, anti-oxidation effect, and DPPH free radical inhibition capacity, and the results are described below. /6

Measurement Example 1

Measurement Example 1 is performed to measure the whitening effect of naturally grown Phellinus Linteus extract obtained by the methods described above in Experimental Examples 1-4 by comparing the degree of tyrosinase inhibition. Tyrosinase is an enzyme that causes melanin to form by activating tyrosine in pigment cells.

This measurement was carried out according to the experimental method of Horowits and A. Vanni. As control groups, naturally grown Phellinus Linteus (0.01, 0.50, 0.10, 1.00, 10.00 volume% to distilled water), oil soluble vitamin (0.01, 0.50, 0.10, 1.00, 10.00 volume % to distilled water), arbutin (0.01, 0.50, 0.10, 1.00, 10.00 volume% to distilled water), and kojic acid (0.01, 0.50, 0.10, 1.00, 10.00 volume% to distilled water) were employed.

Herein, the tyrosinase inhibiting activity was determined by measuring the absorption of the test sample in a micro-plate at 475 nm after 0.9 mL of the test sample was placed in a micro-plate (97 wells),1.0 mL of 0.1 M phosphate buffer solution (pH 6.5) and 0.3 mg/mL L-tyrosine solution were added to the plate, 0.1 mL of tyrosinase (Sigma, 1250 U/mL mushroom tyrosinase) were then added, and the mixture in the micro-plate was reacted at 37°C for 10 min.

Tyrosinase inhibition rate was calculated using the following formula. IC_{50} is an inhibition concentration where the enzyme activity inhibition rate is 50%, and the unit is mg/mL.

Inhibition concentration (IC_{50}) = (Absorption after adding " test sample"/Absorption without adding test sample) x 100

Under such conditions, tyrosinase activity inhibition was tested. The results on inhibition rate of each extract of naturally grown Phellinus Linteus and inhibition concentration IC50 are listed below in Table 1 and suggest excellent whitening effect.

Table 1

품	질	저해율(%)	저해농도 IC_{50}(mg/ml)
인공재배 상황버섯		42.10	0.80
유용성 비타민		51.70	0.50
알부틴		60.30	0.40
코직산		96.60	0.03
자연산 상황버섯	열수 추출물	83.40	0.12
	30% 에탄올 추출물	82.10	.013
	30% 프로판렌글리콜 추출물	80.20	0.15
	30% 1,3-부틸렌글리콜 추출물	80.20	0.15
	30% 이소프로판올 추출물	78.50	0.20
	혼합 추출물 (프로판렌글리콜 30중량부, 1,3-부틸렌글리콜 20중량부, 이소프로판올 20중량부, 증류수 20중량부)	84.00	0.10

Key: 1 Material
2 Artificially grown Phellinus Linteus
3 Oil soluble vitamin

4	Arbutin
5	Kojic acid
6	Naturally grown Phellinus Linteus
6a	Hot water extract
7	30% ethanol extract
8	30% propylene glycol extract
9	30% 1,3-butyleneglycol extract
10	30% isopropanol extract
11	Mixture extract (30 parts by weight of propylene glycol, 20 parts by weight of 1,3-butyleneglycol, 20 parts by weight of isopropanol, and 20 parts by weight of distilled water)
12	Inhibition rate (%)
13	Inhibition concentration IC_{50} (mg/mL)

Measurement Example 2

In the Measurement Example 2, the ultraviolet spectrum (190 - 700 nm) was measured to examine the ultraviolet absorption capacity using naturally grown Phellinus Linteus extract obtained by the methods described above in Experimental Examples 1-4 as in Figure 3. As shown in Figure 3, these extracts exhibited effective ultraviolet absorption capacity at the wavelength between 190-400 nm.

Measurement Example 3

The Measurement Example 3 was performed using naturally grown Phellinus Linteus /7
extract obtained by the methods described above in Experimental Examples 1-4 to examine the inhibition of melanin formation and loss of melanine after irradiating ultraviolet and ultimately to determine the whitening effect of these extracts.

This experimental procedure includes continuous ultraviolet (FL20 - SE lamp) irradiation onto C57BL Mouse (8W, o) at a strength of 15.2 mJ/cm^3, once a day, for 5 days. One week after the final day of the irradiation, the ear was harvested and cartilage was removed. After the skin of the ear was deposited in 2N NaBr solution at 37°C for 2 h, the outer skin was peeled off from the inner skin. The outer skin was deposited in 2 mL of 0.14% L-DOPA solution (0.1 M phosphate buffer solution which was adjusted to pH 7.2) to which 1 mL of the experimental substance was added at 37°C for 3 h, which was then dyed with melanocyte (DOPA dye).

The result was judged by counting number of melanocyte per 1 mm^2 at five different places using microscope, and the average number of cells per 1 mm^2 was calculated. Any test sample was compared with the blank without adding the experimental substance to calculate the inhibition rate. As shown in Figure 3, the experimental results indicates that the subject

substance had better melanin inhibiting effect and pigment deposit loss rate than kojic acid and arbutin against ultraviolet irradiation.

Measurement Example 4

Measurement Example 4 was aimed to determine the melanin formation inhibiting activity against Actinomyces using naturally grown Phellinus Linteus extract obtained by the methods described above in Experimental Examples 1-4, wherein the bacterial strand employed was Streptomyces bikiniensis (NRRL B-1049, KCTC-9172).

S. bikiniensis NRRL B-1049 <KCTC-9127> was cultured at 28°C for 2 weeks in a culture medium, Prpavizas VDYA agar slant (V-8 juice 200 mL, glucose 2 g, Yeast EX 2 g, CaCO3 1g, Agar 20 g, D-Water 800 mL, pH = "7.2") to form spore. Using pasteurized water, the spore suspension was prepared. After 0.2 mL of the spore suspension was coated onto ISP No. 7 flat media to which 0.2% Yeast EX was added, a paper disc which was coated with a test sample at a rate of 30 mg/paper disc was applied on the media surface and the strand was cultured at 28°C.

Inhibition of melanin formation was observed in Table 2 by comparing the size of the melanin formation inhibiting circle formed after 48 h of culture with that of 4-hydroxyanisol as a control group, which is known to be a compound that inhibits melanin formation. The result showed that the naturally grown Phellinus Linteus extracts obtained by ultra-high frequency wave extraction method of the present invention exhibited safe and excellent inhibition effect on melanin formation.

Table 2

물 질		저해환지름(mm)	저해율(%)
인공재배 상황버섯 0.5% 수용액		18.0± 1.5	30.8
비타민C 0.5% 수용액		8.0± 1.5	69.2
알부틴 0.5% 수용액		N.D	-
감초 추출물 0.5% 수용액		22.0± 1.5	15.4
코직산 0.5% 수용액		24.0± 1.5	7.7
자연산 상황버섯 0.5% 수용액	열수 추출물	13.0± 1.5	50.0
	30% 이탄올 추출물	16.0± 1.5	38.5
	30% 프로필렌글리콜 추출물	16.0± 1.5	38.5
	30% 1,3-부틸렌글리콜 추출물	14.0± 1.5	46.2
	30% 이소프로판올 추출물	11.5± 1.5	56.8
	혼합 추출물 (프로필렌글리콜 30중량부, 1,3- 부틸렌글리콜 20중량부, 이소프로판올 20중량부, 증류수 20중량부)	8.0± 1.5	69.2

Key: 1 Material
2 Artificially grown Phellinus Linteus 0.5% aqueous solution
3 Vitamin C 0.5% aqueous solution
4 Arbutin 0.5% aqueous solution

5 Licorice root extract 0.5% aqueous solution
6 Kojic acid 0.5% aqueous solution
7 Naturally grown Phellinus Linteus 0.5% aqueous solution
8 Hot water extract
9 30% ethanol extract
10 30% propylene glycol extract
11 30% 1,3-butyleneglycol extract
12 30% isopropanol extract
13 Mixture extract
(30 parts by weight of propylene glycol, 20 parts by weight of 1,3-butyleneglycol, 20 parts by weight of isopropanol, and 20 parts by weight of distilled water)
14 Inhibition circle diameter (mm)
15 Inhibition rate (%)

Measurement Example 5

Measurement Example 5 is carried out to measure the anti-oxidation capacity of the naturally grown Phellinus Linteus extract obtained by the methods described above in Experimental Examples 1-4, which are expressed by the degree of inhibition for auto-oxidation in lipid peroxidation using linoleic acid which can be easily auto-oxidized; and by DPPH free radical scavenging effect by Funita et. al.

The anti-oxidation effect was measured by comparing the absorption at 500 nm of the test /8
sample solution with that of the control group that does not contain an effective anti-oxidation test sample and the anti-oxidation effect was expressed in %. The test sample solution was prepared by mixing 2 mg/mL linolenic acid, 10 mg/mL Tween 20, 0.2 M phosphate buffer solution (pH 8.4), and the test sample to give 0.1 mL, then by culturing the mixture at 37°C for 24 h, and (finally) by adding 0.1 mL of 80% ethanol, 0.1 mL of ammonium thiocyanate, and 0.1 mL of 20 mM ferrous ammonium sulfate - 3.5% hydrochloric acid to the cultured mixture. Absorption was measured 3 min after the test sample solution was prepared.

DPPH free radical scavenging effect was determined by measuring the absorption at 516 nm at 37°C 30 min after 1.0 mL of 0.1 mM DPPH methanolic acid and 1.0 mL of ethanolic test sample were mixed, and then by comparing this result with that of 0.1 mM DPPH methanolic acid that does not contain the test sample, as shown in Table 3.

Table 3

물 질		항산화효과(%)	DPPH 유리기 억제율(%)
인공재배 상황버섯 1.0% 에탄올용액		79.8	67.3
비타민E 1.0% 에탄올용액		43.3	36.5
알부틴 1.0% 에탄올용액		N.D	N.D
녹차 추출물 1.0% 에탄올용액		83.1	88.6
당근추출물 1.0% 에탄올용액		17.0	N.D
은행잎 추출물 1.0% 에탄올용액		68.0	69.5
자연산 상황버섯 1.0% 에탄올 용액	열수 추출물	91.6	84.9
	30% 에탄올 추출물	90.4	82.5
	30% 프로필렌글리콜 추출물	90.9	82.0
	30% 1.3-부틸렌글리콜 추출물	91.0	83.4
	30% 이소프로판올 추출물	80.5	80.3
	혼합 추출물 (프로필렌글리콜 30중량부, 1.3-부틸렌글리콜 20중량부, 이소프로판올 20중량부, 증류수 20중량부)	94.7	87.1

Key: 1 Material
2 Artificially grown Phellinus Linteus 1.0% ethanolic solution
3 Vitamin E 1.0% ethanolic solution
4 Arbutin 1.0% ethanolic solution
5 Green tea extract 1.0% ethanolic solution
6 Carrot extract 1.0% ethanolic solution
7 Gingko leaf extract 1.0% ethanolic solution
8 Naturally grown Phellinus Linteus 1.0% ethanolic solution
9 Hot water extract
10 30% ethanol extract
11 30% propylene glycol extract
12 30% 1,3-butyleneglycol extract
13 30% isopropanol extract
14 Mixture extract
(30 parts by weight of propylene glycol, 20 parts by weight of 1,3-butyleneglycol, 20 parts by weight of isopropanol, and 20 parts by weight of distilled water)
15 Anti-oxidation effect (%)
16 DPPH free radical inhibition rate (%)

The following describes the preparation of the whitening cosmetic material of the present invention using the Phellinus Linteus extract obtained by the aforementioned methods in Experimental Examples 1-4. The whitening cosmetic material can be manufactured into a beauty wash, oil, or cream by adding conventional cosmetic base material using a general cosmetic manufacturing method.

Such whitening cosmetic material containing naturally grown Phellinus Linteus extract is a cosmetic material that contains (a) 0.10-40.0 parts by weight of naturally grown Phellinus Linteus concentrated extract obtained using the aforementioned method of Experimental

Examples 1-4, (b) one or more selected from 0.1-5.0 parts by weight of octylmethoxy cinnamate, 0.1-5.0 parts by weight of benzoate, and 0.1-5.0 parts by weight of oxybenzone, (c) one or more selected from 0.10-30.0 parts by weight of melanin synthesis inhibiting peptide, 0.1-30.0 parts by weight of licorice root extract, 0.1-30.0 parts by weight of arbutin, and 0.1-30.0 parts by weight of rice extract.

Among them, one or two or more of the ingredient (b) and the ingredient (c) may be added, but the present invention is not limited to these (combinations). When more than 5.0 parts by weight of the ingredient (b) are added, problems associated with the application feeling, stability, and stability may be presented. Therefore, it is desirable to add less than 5.0 parts by weight of the ingredient (b).

The whitening cosmetic material containing naturally grown Phellinus Linteus extract of the present invention is characterized by the combination of the aforementioned (a), (b), and (c) ingredients, but other base materials employed for conventional whitening cosmetic material and various additives may be added besides these ingredients. For example, powder, activating agent, fragrance, and preservative may be added.

The whitening cosmetic material of the present invention is described below in more detail referring to Experimental Examples 5-8. These experimental examples are described only to illustrate the present invention, and the scope of the present invention is not limited to these experimental examples.

The following Experimental Example 5 and Experimental Example 6 describe the preparation of the whitening cream using naturally grown Phellinus Linteus extract obtained using the aforementioned methods Experimental Examples 1-4. /9

Experimental Example 5

The whitening cream was prepared by mixing 20 parts by weight of naturally grown Phellinus Linteus extract, 3.0 parts by weight of cetostearyl alcohol, 1.0 part by weight of wax, 3.0 parts by weight of self emulsified monostearic acid glycerin, 1.0 part by weight of lolisorbate 60, 0.4 parts by weight of sorbitan stearate, 1.6 parts by weight of preservative, 5.0 parts by weight of anti-oxidant, 10 parts by weight of mineral oil, 5.0 parts by weight of squalene, 5.0 parts by weight of sodium hyaluronate, 5.0 parts by weight of propylene glycol, and 40 parts by weight of purified water.

Experimental Example 6

The whitening cream was prepared by mixing 18 parts by weight of naturally grown Phellinus Linteus extract, 3.0 parts by weight of cetostearyl alcohol, 1.0 part by weight of wax, 3.0 parts by weight of self emulsified monostearic acid glycerin, 1.0 part by weight of lolisorbate

60, 0.4 parts by weight of sorbitan stearate, 10 parts by weight of mineral oil, 5.0 parts by weight of squalene, 5.0 parts by weight of sodium hyaluronate, 5.0 parts by weight of propylene glycol, 1.6 parts by weight of anti-oxidant, 0.2 parts by weight of benzophenone, 0.3 parts by weight of oxybenzone, 0.5 parts by weight of octylmethoxycinamate, 30 part by weight of purified water, 5.0 parts by weight of melanin formation inhibiting peptide, 5.0 parts by weight of licorice root extract, 1.0 part by weight of arbutin, and 5.0 parts by weight of rice extract.

The composition and mixing ratio of the whitening cream prepared in the aforementioned Experimental Example 5 and Experimental Example 6 is listed in Table 4.

Table 4

성 분		실시예 5 (중량부)	실시예 6 (중량부)	비교예 1 (중량부)
제 1상	세토스테아릴알콜	30.	3.0	3.0
	밀납	1.0	1.0	1.0
	자기유화형 모노 스테아린산글리세린	3.0	3.0	3.0
	폴리소르베이트 60	1.0	1.0	1.0
	방부제	0.4	0.4	0.4
	소르비탄 스테아레이트	적량	적량	적량
	항산화제	적량	적량	적량
	미네랄오일	10.0	10.0	10.0
	벤조페논	-	0.2	-
	옥시벤존	-	0.3	-
	옥틸메톡시신나메이트	-	0.5	-
	스쿠알란	5.0	5.0	5.0
제 2상	히아루론산 나트륨	5.0	5.0	5.0
	프로필렌 글리콜	5.0	5.0	5.0
	자연산 상황버섯 추출물	20.0	19.0	-
	정제수	전함량이 100이 되도록 함.		
제 3상	멜라닌생성억제 효모온	-	5.0	-
	감초추출물	-	5.0	-
	알부틴	-	1.0	-
	쌀추출물	-	5.0	-

Key:
1 Ingredient
2 First phase
3 Cetosteatyl alcohol
4 Wax
5 Self emulsified mono-stearic acid glycerin
6 Polysorbate 60
7 Preservative
8 Sorbitan stearate
9 Anti-oxidant
10 Mineral oil
11 Benzophenone
12 Oxybenzone

13 Octylethoxycinnamate
14 Squalene
15 Experimental Example 5 (part by weight)
16 Appropriate amount
17 Appropriate amount
18 Experimental Example 6 (part by weight)
19 Appropriate amount
20 Appropriate amount
21 Comparative Example 1 (part by weight)
22 Appropriate amount
23 Appropriate amount
24 Second phase
25 Sodium hyaluronate
26 Propylene glycol
27 Naturally grown Phellinus Linteus extract
28 Purified water
29 Third phase
30 Melanin formation inhibiting hormone
31 Licorice root extract
32 Arbutin
33 Rice extract
34 Quantity added to make the total amount 100 .

In the preparation of the whitening cream in the aforementioned Experimental Example 5 /10
and Experimental Example 6, the first phase and the second phase were dissolved homogeneously at 75-85°C in a separate container; the first phase was added to the second phase; the mixture was stirred and emulsified using a homo-mixer for 5 min at 3600 rpm and paddle-mixer for 25 min at 25 rpm; the obtained mixture was cooled again to 40-50°C, to which the third phase was added; the resulting mixture was stirred with a paddle mixer at 25 rpm and then cooled to obtain the whitening cream.

The following Experimental Example 7 and Experimental Example 8 describe the preparation of whitening wash using the naturally grown Phellinus Linteus extract obtained using the aforementioned method in Experimental Examples 1-4.

Experimental Example 7

The whitening wash was prepared by mixing 5.0 parts by weight of naturally grown Phellinus Linteus extract, 5.0 parts by weight of sodium hyaluronate, 5.0 parts by weight of propylene glycol, 5.0 parts by weight of glycerin, 0.05 parts by weight of disodium ethylenediamine tetraacetate, 75 parts by weight of purified water, 3.0 parts by weight of ethanol,

1.25 parts by weight of anti-oxidant, and 0.7 parts by weight of polyoxyethylene hardened castor oil.

Experimental Example 8

The whitening wash was prepared by mixing 5.0 parts by weight of naturally grown Phellinus Linteus extract, 5.0 parts by weight of sodium hyaluronate, 5.0 parts by weight of propylene glycol, 5.0 parts by weight of glycerin, 0.05 parts by weight of disodium ethylenediamine tetraacetate, 3.0 parts by weight of ethanol, 0.7 parts by weight of polyoxyethylene hardened castor oil, 59 parts by weight of purified water, 0.2 parts by weight of oxybenzone, 0.5 parts by weight of octylmethoxy cinnamate, 5.0 parts by weight of melanin formation inhibiting peptide, 5.0 parts by weight of licorice root extract, 1.0 part by weight of arbutin, 5.0 parts by weight of rice extract, and 0.55 parts by weight of anti-oxidant.

The composition and mixing ratio of the whitening wash prepared by the aforementioned Experimental Example 7 and Experimental Example 8 are listed in Table 5.

Table 5

성 분		실시예 7 (중량부)	실시예 8 (중량부)	비교예 2 (중량부)
제 1상	글리세린	5.0	5.0	5.0
	히아루론산 나트륨	5.0	5.0	5.0
	에틸렌디아민 테트라 아세트산 이나트륨	0.05	0.05	0.05
	프로필렌 글리콜	5.0	5.0	5.0
	자연산 상황버섯 추출물	5.0	5.0	-
	옥시벤존	-	0.2	-
	옥틸메톡시 신나메이트	-	0.5	-
	멜라닌생성억제 호르몬	-	5.0	-
	감초추출물	-	5.0	-
	알부틴	-	1.0	-
	쌀추출물	-	5.0	-
	정제수	전함량이 100이 되도록 함.		
제 2상	에탄올	3.0	3.0	3.0
	방부제	적량	적량	적량
	항산화제	적량	적량	적량
	폴리옥시에틸렌 경화 피마자유(40E.O)	0.7	0.7	0.7

Key:
1 Ingredient
2 First phase
3 Glycerin
4 Sodium hyaluronate
5 Disodium ethylenediamine tetraacetate
6 Propylene glycol
7 Naturally grown Phellinus Linteus extract
8 Oxybenzone

9 Octylethoxycinnamate
10 Melanin formation inhibiting hormone
11 Licorice root extract
12 Arbutin
13 Rice extract
14 Purified water
15 Second phase
16 Ethanol
17 Preservative
18 Anti-oxidant
19 Polyoxyethylene hardened castor oil (40E.0)
20 Experimental Example 7 (part by weight)
21 Quantity added to make the total amount 100
22 Appropriate amount
23 Experimental Example 8 (part by weight)
24 Comparative Example 2 (part by weight)

The whitening wash described in the aforementioned Experimental Example 7 and Experimental Example 8 was prepared by homogenizing the first phase and the second phase separately at room temperature and then by slowly adding the second phase into the first phase while stirring with a stir rod.

The effect of the whitening cream prepared with such ingredients and mixing ratio as /11
described in Experimental Example 5 and Experimental Example 6 on the external skin product for freckles and liver spots was investigated by the Well Control Test using a double blind method. The results obtained from the Well Control Tests was converted into lightness (L value) using a Chromameter (Minolta Co. Chromameter CR-300) for the Well Control Test results, wherein the whitening cream contains naturally grown Phellinus Linteus extract, melanin formation inhibiting hormone, licorice root extract, arbutin, rice extract, and ultraviolet blocking agent.

As an experimental method, the upper arm was irradiated three times with ultraviolet of 0.88 J/cm^2 once a day, and then the test sample was applied twice a day for 30 days. The L value before and after the application, which is the measure of whitening effect, and dL value which is the difference between the L values of the applied area and normal peripheral area were obtained over time. This result was compared in Figure 4 which illustrates the rate of pigment deposit loss.

The whitening effect is calculated by L (%) = l (L value before application - L value after the application)/L value before the application l x 100. Table 6 shows that the combined use of the naturally grown Phellinus Linteus extract, other effective whitening ingredients, and ultraviolet blocking agent not only prevents skin browning but also removes skin blotches, leading to exceptional improvement in whitening effect.

Table 6

	미백효과 L(%)
실시예 5	79.9
실시예 6	94.0
비교예 1	35.0

Key: 1 Experimental Example __
2 Comparative Example __
3 Whitening effect L (%)

In addition, Table 7 lists the results obtained from measuring the anti-oxidation effect of the whitening wash prepared using the ingredients and method described in Experimental Example 7 and Experimental Example 8. This results indicate that the whitening wash has excellent anti-oxidation effect and free radical scavenging activity.

Table 7

	항산화 효과 L(%)	DPPH 유리기 억제율(%)
실시예 7	82.9	91.1
실시예 8	81.3	88.5
비교예 2	54.0	55.4

Key: 1 Experimental Example __
2 Comparative Example __
3 Antioxidation effect L (%)
4 DPPH free radical scavenging rate (%)

As in the aforementioned Experimental Examples 5 and 6, the whitening cosmetic material containing the naturally grown Phellinus Linteus extract blocks ultraviolet effectively, therefore improving both skin aging prevention and whitening effect, producing excellent results.

Effect of the invention

As described above, the present invention uses naturally grown Phellinus Linteus which has strength of approximately 0.5-0.8 N/mm^2 and much higher contents of various sugars, flabonoid, fiber, and isoflavon than artificially grown Phellinus Linteus. The aforementioned naturally grown Phellinus Linteus was pulverized to fine powder. This pulverized naturally grown Phellinus Linteus powder was treated with ultra-high frequency waves at 55-65°C under reduced pressure using a solvent such as ethanol aqueous solution, 1,3-butylene glycol, propylene glycol, and isopropanol, which was then filtered to retrieve naturally grown Phellinus Linteus extract. This extract was combined with one or more ultraviolet blocking absorption

agents or ultraviolet dispersion agents, one or more of melanin synthesis inhibiting peptides, Licorice root extract, arbutin, rice extract, and vitamin C to make whitening cosmetic material. Such a whitening cosmetic material not only improves skin color tone, freckles, and liver spots by preventing pigment deposits or skin browning caused by ultraviolet and by inhibiting melanin synthesis in skin, but also prevents skin aging by an anti-oxidation effect.

Claims

1. A whitening cosmetic material containing natural Phellius Linteus extract which was /12
retrieved by pulverizing natural Phellius Linteus with a hardness of 0.5-0.8 N/mm^2 into powder; treating this natural Phellius Linteus powder with ultra high frequency waves in a certain solvent under reduced pressure; discoloring and removing odor, wherein a whitening cosmetic material containing natural Phellius Linteus extract is composed of 20 parts by weight of the aforementioned natural Phellius Linteus extract, 3.0 parts by weight of setostearyl alcohol, 1.0 part by weight of wax, 3.0 parts by weight of self-emulsified monostearic acid glycerin, 1.0 part by weight of lolisorbate 60, 0.4 parts by weight of sorbitan stearate, 1.6 parts by weight of preservative, 5.0 parts by weight of anti-oxidant, 10 parts by weight of mineral oil, 5.0 parts by weight of squalene, 5.0 parts by weight of sodium hyaluronate, 5.0 parts by weight of propylene glycol, and 40 parts by weight of purified water.

2. The whitening cosmetic material containing natural Phellius Linteus extract claimed in Claim 1, wherein the whitening cosmetic material consists of 18 parts by weight of the natural Phellius Linteus extract, 1.6 parts by weight of anti-oxidant, 0.2 parts by weight of benzophenone, 0.3 parts by weight of oxybenzone, 0.5 parts by weight of octylmethoxycinnamate, 30 parts by weight of purified water, 5.0 parts by weight of melanin synthesis inhibiting peptide, 5.0 parts by weight of licorice root extract, 1.0 part by weight of arbutin, and 5.0 parts by weight of rice extract, instead of using 20 parts by weight of the aforementioned natural Phellius Linteus extract, 1.6 parts by weight of preservative, 5.0 parts by weight of anti-oxidant, and 30 parts by weight of purified water.

3. The whitening cosmetic material containing natural Phellius Linteus extract claimed in Claim 1, wherein the whitening cosmetic material consists of 5.0 parts by weight of the natural Phellius Linteus extract, 5.0 parts by weight of glycerin, 0.05 parts by weight of disodium ethylenediamine teteraacetate, 75 parts by weight of purified water, 3.0 parts by weight of ethanol, 1.25 parts by weight of anti-oxidant, and 0.7 parts by weight of polyoxyethylene hardened castor oil, instead of using 20 parts by weight of the aforementioned natural Phellius Linteus extract, 3.0 parts by weight of setostearyl alcohol, 1.0 part by weight of wax, 3.0 parts by weight of self-emulsified monostearic acid glycerin, 1.0 part by weight of lolisorbate 60, 0.4 parts by weight of sorbitan stearate, 1.6 parts by weight of preservative, 5.0 parts by weight

of anti-oxidant, 10 parts by weight of mineral oil, 5.0 parts by weight of squalene, and 40 parts by weight of purified water.

4. The whitening cosmetic material containing natural Phellius Linteus extract claimed in Claim 3, wherein the whitening cosmetic material consists of 59 parts by weight of purified water, 0.2 parts by weight of oxybenzone, 0.5 parts by weight of octylmethoxy cinnamate, 5.0 parts by weight of melanin synthesis inhibiting peptide, 5.0 parts by weight of licorice root extract, 1.0 part by weight of arbutin, 5.0 parts by weight of rice extract, and 0.55 parts by weight of anti-oxidant, instead of using 75 parts by weight of the aforementioned purified water and 1.25 parts by weight of anti-oxidant.

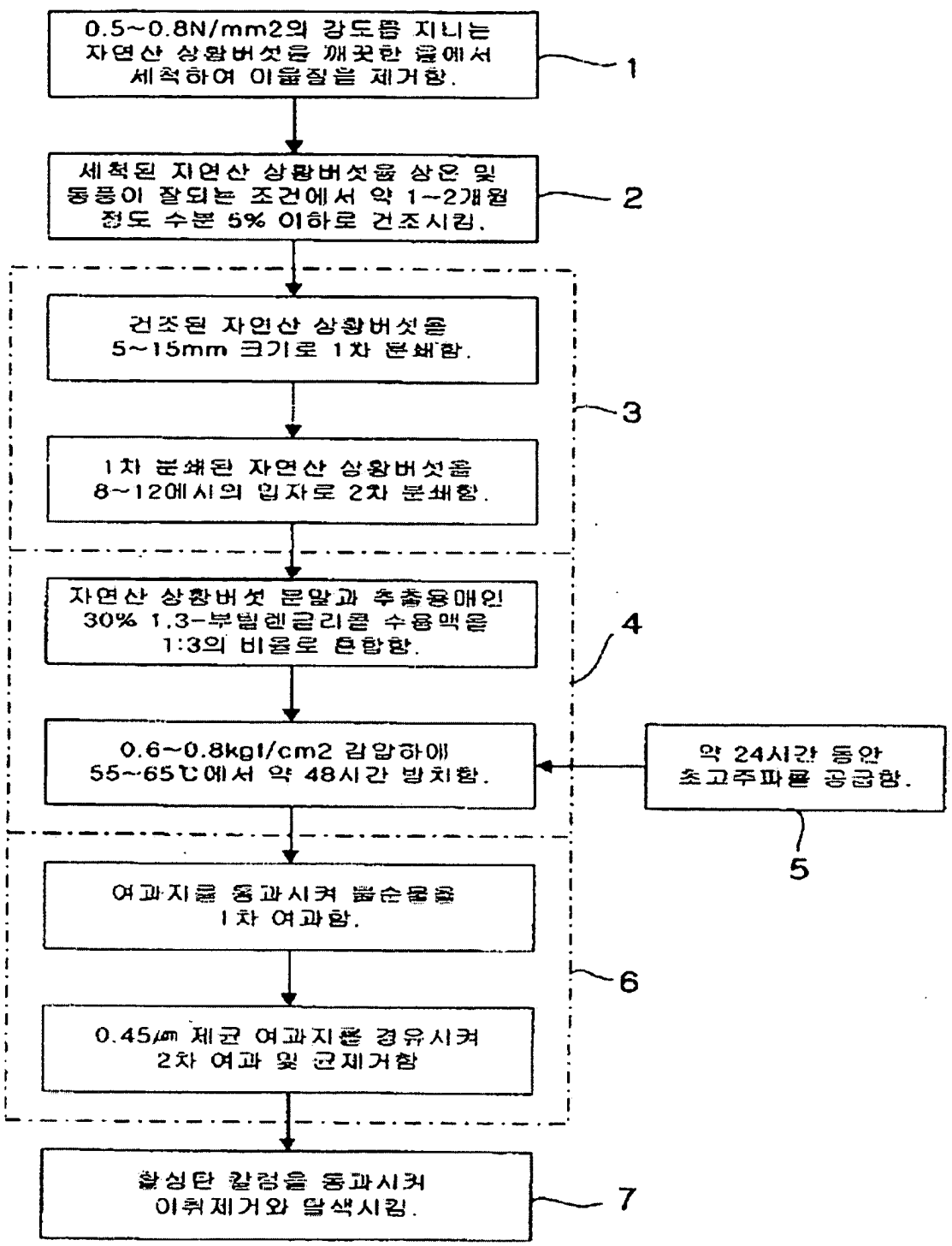

Figure 1

Key: 1 Washing naturally grown Phellinus Linteus of 0.5-0.8 N/mm^2 strength in clean water to remove foreign matter

2 Drying the washed naturally grown Phellinus Linteus at a well ventilated place at room temperature for approximately 1-2 months until the moisture content is less than 5%.

3 Initial pulverizing the dried naturally grown Phellinus Linteus to 5-15 mm size.
Pulverizing the first pulverized naturally grown Phellinus Linteus second time to 8-12 mesh particles.

4 Mixing the naturally grown Phellinus Linteus powder and an extraction solvent, 30% 1,3-butyleneglycol aqueous solution in an 1:3 ratio.
Leaving the mixture at 55-65°C for approximately 48 h under reduced pressure of 0.6-0.8 kgl/cm^2.

5 Supplying ultra-high frequency wave for approximately 24 h.

6 First filtrating to remove impurities by passing through filter paper.
Second filtration by passing through 0.45 mm bacteria removing filter paper and removing bacteria.

7 Removing odor and decoloring by passing through activated carbon column.

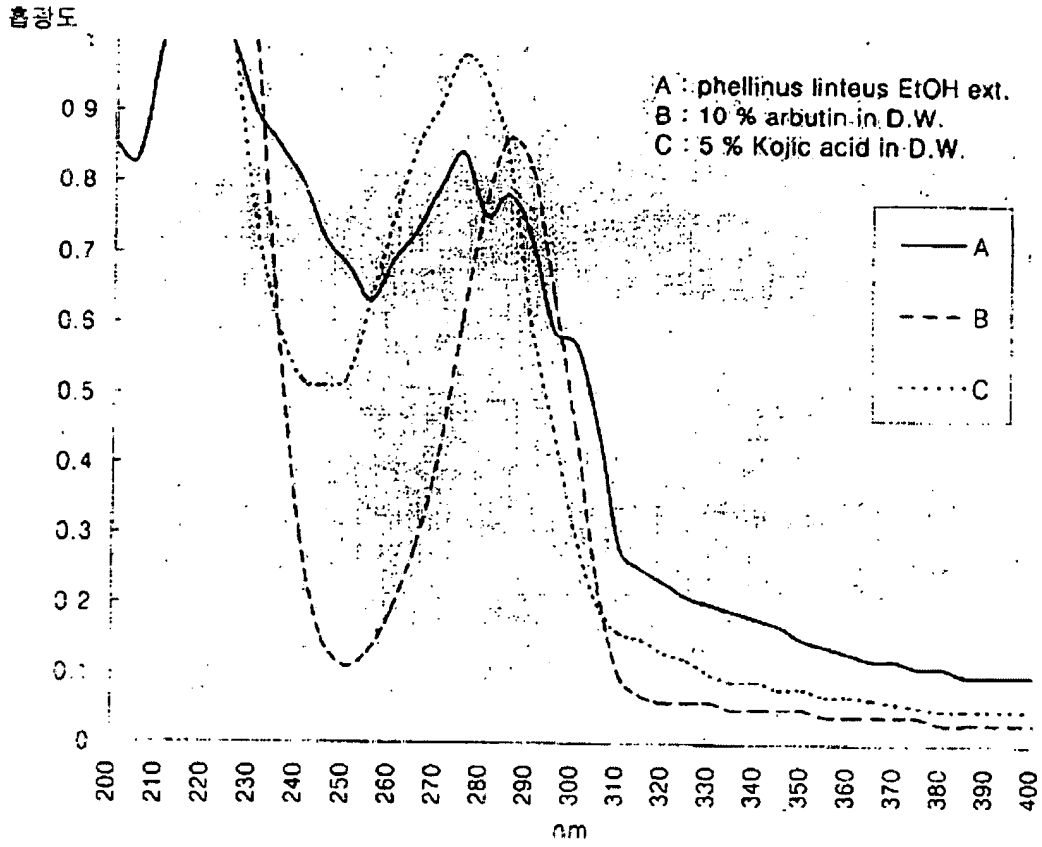

Figure 2

Key: 1 Absorption

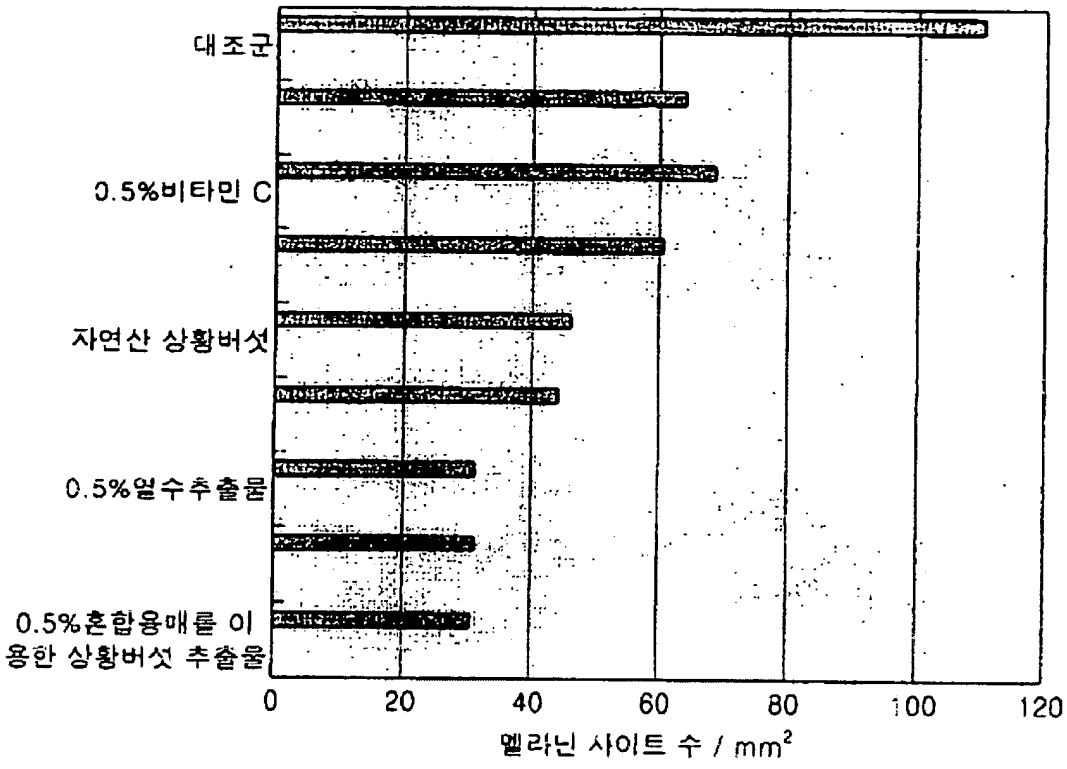

Figure 3

Key:
1 Control group
2 0.5% Vitamin C
3 Naturally grown Phellinus Linteus
4 0.5% hot water extracts
5 Phellinus Linteus extracts using 0.5% mixed solvents
6 Number of melanine sites/mm^2

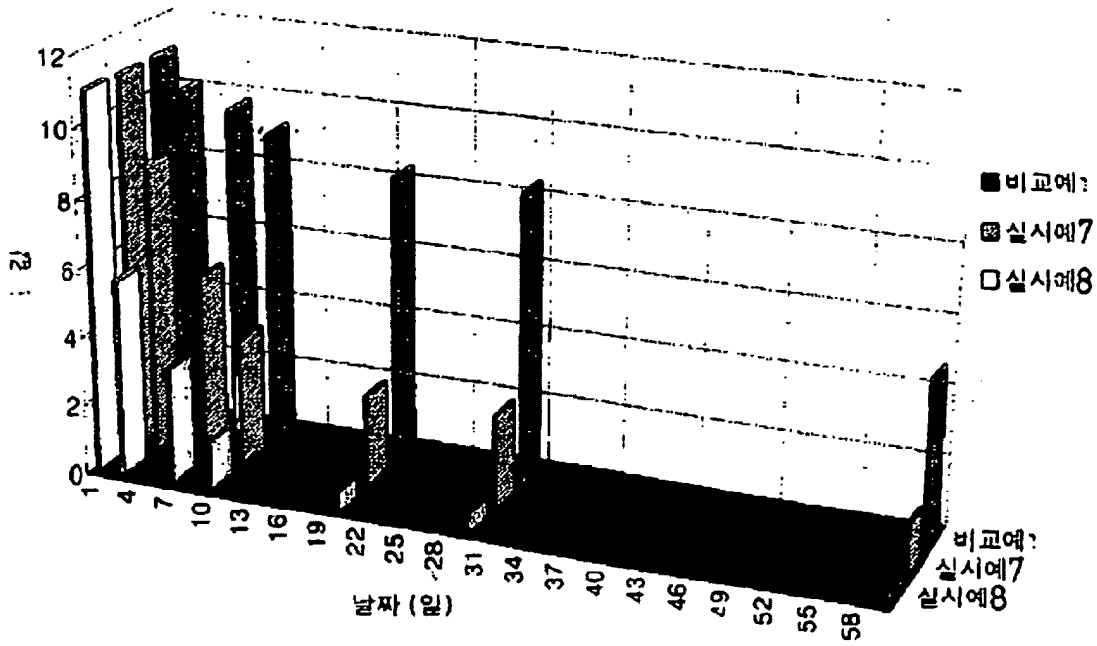

Figure 4

Key: 1 Value
2 Date (day)
3 Comparative Example __
4 Experimental Example __